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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/735,009	12/12/2000	Charles E. Boardman	24-BR-6010	3389

7590                    02/03/2003

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[REDACTED] EXAMINER

PALABRICA, RICARDO J

[REDACTED] ART UNIT

[REDACTED] PAPER NUMBER

3641

DATE MAILED: 02/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Offic Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/735,009	BOARDMAN ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Rick Palabrica	3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 13 December 2002.

2a) This action is FINAL.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-35 is/are pending in the application.

4a) Of the above claim(s) 12-24,34 and 35 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-11 and 25-33 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.                    4) Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_

## DETAILED ACTION

1. Applicant's Request for Continued Examination and amendments to claims 1 and 25, which were submitted on 12/13/02, are acknowledged.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 6-11, 28-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6, 8, 28 and 30 contain functional phrases or clauses such as the "wherein" clause, the content of which does not inherently follow from the actual structure recited. Claims 7, 9, 29, 31 recite "an exhaust from said gas topping heater is directed to...", which is similar to the "wherein" clause. Claims 10, 11, 32 and 33 recite "a portion of an output ...", which is also similar to the "wherein" clause. Thus, the scope of the claims and/or the metes and bounds thereof cannot be determined. Said clauses accordingly raise a question as to the limiting effect of the language therein on the claims (see MPEP 2106.II.C).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-11 and 25-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,576,783 to Koutz in view of either one of Interrante et al. (U.S. 3,821,358) or Wentorf, Jr. (U.S. 3,842,164). Koutz discloses the applicant's claims except for the use of a liquid metal reactor and a gas heater to raise the temperature of the feed water heated by a liquid metal reactor, or the inclusion of a desalination plant in the system.

Koutz discloses the same inventive concept as the applicant of augmenting the temperature of a working fluid heated by a nuclear reactor to provide a temperature necessary to carry out thermal decomposition of water to produce hydrogen (see column 1, 2<sup>nd</sup> paragraph and column 2, lines 30+). Koutz discloses a high temperature gas cooled reactor with a reactor core (12) that heats the radioactive, primary coolant to approximately 1350°F. Koutz also discloses a steam turbine that drives an electric generator (see column 3, lines 27-30). Koutz further teaches the use of at least three regenerative heat exchangers in his system (see, for example, column 2, lines 55-59; column 3, lines 20-25).

Applicant's claim language reads on Koutz' invention as follows: "feed water" reads on the "feed water supply", "steam generator" reads on "heat exchanger 38", "topping heater" reads on the combination of heaters "4A and 5A", and "high temperature cracking system" reads on process chamber 30." Note that the feed water input line is in flow communication with the steam generator, the topping heater, and high temperature water cracking system. Also, note that the feed water is dissociated into hydrogen and oxygen in the high temperature cracking system.

Either one of Interrante et al. or Wentdorf, Jr. teach the use of either a high temperature gas reactor or a liquid metal reactor as a heat source for thermochemical production of hydrogen and oxygen (e.g. see column 2, lines 28+ in Interrante et al. or column 2 lines 45+ in Wentdorf, Jr.).

One having ordinary skill in the art would have recognized that substituting a liquid metal reactor as primary heat source for the gas-cooled of Koutz would have been *prima facie* obvious.

As to the limitations regarding the gas-fired heaters, regenerative heat exchangers and gas desalination plant, which the examiner stated on page 5 of his 3/19/02 Office Action as well known in the art, said statement was not seasonably traversed by the applicant. Therefore, these objects of the well-known statement are taken to be admitted prior art. See MPEP 2144.03.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system, as disclosed by Koutz, by the teaching of either one of Interrante et al. or Wentdorf, Jr., and admitted prior art, in order

to have a system for generating hydrogen comprising feed water, liquid metal reactor, steam generator, high temperature water cracking system, and gas topping heater, as this is no more than the use of well known techniques/design in the nuclear art, and the substitution of one system component by another well known system component.

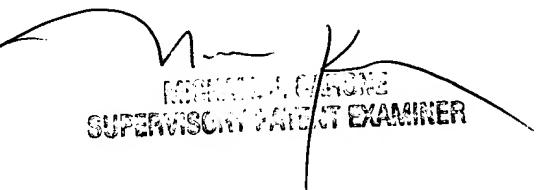
### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrida whose telephone number is 703-306-5756. The examiner can normally be reached on 7:00-4:30, Mon-Fri; 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

RJP  
January 29, 2003

  
MICHAEL J. CARONE  
SUPERVISORY PATENT EXAMINER